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Name	Function
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## APPROVAL CONTROL

Control	Name	Organization	Function	Date
Prepared	Markus Roth	KIS	Project Scientist	February 1, 2019
Prepared	Rolf Schlichenmaier	KIS	Coordinator	January 31, 2019
Revised	Tirtha Som	KIS	Project Manager	March 14, 2019
Approved	Rolf Schlichenmaier	KIS	Coordinator	April 24, 2019
Authorized	Markus Roth	KIS	Project Scientist	April 25, 2019

## HISTORY OF DOCUMENT CHANGES

Issue	Date	Change Description
Version 1.0	April 25, 2019	Initial Issue

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## List of Participants:

# of Part	Name	Beneficiary name	B. #	Member of GA	For Members: Present/ Represented/ Absent [P/R/A]	Represented by
1	Nazaret Bello Gonzalez	KIS	1			
2	Oskar von der Lühe	KIS	1			
3	Rolf Schlichenmaier (Coordinator)	KIS	1	member	P	
4	Markus Roth (Project Scientist)	KIS	1			
5	Tirtha Som (Project Manager)	KIS	1			
6	Dirk Soltau	KIS	1			
7	Manuel Collados Vera	IAC	2	member	P	
8	Carmen M. Barreto Cabrera	IAC	2			
9	Alejandra Martín Gálvez	IAC	2			
10	Alberto Escobar Rodríguez	IAC	2			
11	Jacinto Vaz Cedillo	IAC	2			
12	Carlos Domínguez Tagle	IAC	2			
13	Jorge Sánchez Capuchino	IAC	2			
14	Juan Cozar Castellanos	IAC	2			
15	Luz M. Montoya Martínez	IAC	2			
16	Andres Asensio Ramos	IAC	2			
17	Mats Carlsson	UiO	3	member	P	
18	Dan Kiselman	SU	4	member	P	
19	Göran Scharmer	SU	4			
20	Mats Löfdahl	SU	4			
21	Bernard Gelly	CNRS	5	member	P	
22	Ilaria Ermolli	INAF	6	member	P	
23	Elena Masciadri	INAF	6			
24	Marco Molinaro	INAF	6			
25	Paolo Romano	INAF	6			
26	Marco Stangalini	INAF	6			

27	Francesco Berrilli	UNITOV	7	member	P	
28	Luca Giovannelli	UNITOV	7			
29	Francesca Zuccarello	UNICT	8	member	P	
30	Salvo Guglielmino	UNICT	8			
31	Roberto Barbaera	UNICT	8			
32	Luis Bellot Rubio	IAA-CSIC	9	member	P	
33	Michiel van Noort	MPG/MPS	10	member	P	
34	Carsten Denker	AIP	11	member	P	
35	Christoph Kuckein	AIP	11			
36	Meetu Verma	AIP	11			
37	Richard Morton	NU	12	member	P	
38	Shaun Bloomfield	NU	12			
39	Robertus von Fay-Siebenburgen	USFD	13	member	P	
40	Chris Nelson	USFD	13			
41	Sarah Matthews	UCL	14	member	P	
42	Bob Bentley	UCL	14			
43	Mihalis Mathioudakis	QUB	15	member	P	
44	Jan Jurcak	ASU	16			
45	Michal Sobotka	ASU	16	member	P	
46	Robbe Vansintjan	ROB	17	member	P	
47	Veronique Delouille	ROB	17			
48	David Berghmans	ROB	17			
49	Frederic Clette	ROB	17			
50	Sabrina Bachet	ROB	17			
51	Roman Brajsa	HVAR	18	member	P	
52	Davor Sukar	HVAR	18			
53	Peter Gömöry	AISAS	19	member	P	
54	Ales Kucera	AISAS	19			
55	Michele Bianda	USI/IRSOL	20	member	P	
56	Rolf Krause	USI	20			
57	Astrid Veronig	UNI GRAZ	21	member	P	
58	Arnold Hanslmeier	UNI GRAZ	21			
59	Tatjana Podladchikova	SKOLTECH	22	member	P	
60	Daria Romanova	Skoltech	22			
61	Andrew Leonard	APERIO	23	member	P	
	Vincent Hardy	ALPAO	24		R	Rolf Schlichenmaier
62	Guido Roth	SMN	25	member	P	

63	Yves Salaun	WO	26	member	P	
64	Huguet Chantome	WO	26			
65	Yoshinori Suematsu	NINS/NAOJ	27	member	P	
		AURA	28		A	
		Fraunh./IOS B	29		A	
	Daniele Gallieni	ADS	30		R	Luca Giovanelli
		BDP E&M	31		A	
66	Javier de Cos Juez	UNIOVI	32	member	P	
67	Tim Morris	UDUR	33		P	
	Laurent Jolissaint	HES-SO	34	member	R	Matha Liley
68	Martha Liley	HES-SO	34			
69	Xavier Verians	AMOS	35	member	P	

## Agenda:

- (1) **09:30** Welcome (Rolf Schlichenmaier, KIS)
- (2) **09:35** Overview of SOLARNET Project (Rolf Schlichenmaier, KIS)
  - (2a) Compilation of Partner Representatives for the SOLARNET Board.
- (3) **10:00** Welcome and Guidelines by EU Project Officer (Keji Alex Adunmo)
- (4) **10:16** Presentation of Work Package 1 - Management (Markus Roth, KIS)

### **10:45 – 11:00** Coffee Break

- (5) **11:00** Elections
  - (5a) Chair of SOLARNET General Assembly
  - (5b) Election of Work Packages leaders
  - (5c) Chair of Executive Board

### Presentations of Work Packages

- (6) **11:11** Work Package 2 - (Dan Kiselman, SU)
- (7) **11:24** Work Package 3 (Francesca Zuccarello, UNICT)
- (8) **11:43** Work Package 4 (Richard Morton, NU)
- (9) **12:00** Work Package 5 (Nazaret Bello González, KIS)
- (10) **12:12** Work Package 6 (Manolo Collados, IAC)

### **12:45 – 14:15** Lunch Break and Networking

- (11) **14:15** Work Package 7 (Oskar von der Lühe, KIS)
- (12) **14:45** Work Package 8 (Markus Roth, KIS)
- (13) **15:03** Work Package 9 (Dan Kiselman, SU)
- (14) **15:20** Work Package 10 (Mats Carlsson, UiO)
- (15) **15:40** Miscellaneous

### **15:45** End of General Assembly Kick-Off Meeting

15:50 - 16:00 Coffee Break & Networking

Project Officer Keji Adumno participates from 09:30 until 10:45.

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## Minutes

### (1) 09:30: Welcome (by Rolf Schlichenmaier, KIS, SOLARNET coordinator)

Rolf Schlichenmaier, the coordinator of SOLARNET welcomes all the participants. The SOLARNET project officer, Keji Adunmo, is also present. The coordinator gratefully acknowledges the help of the Project Officer during the grant agreement preparation phase.

The Agenda is presented and discussed, and then adopted.

**All presentations from the coordinator and the work package leaders that are presented during the Kick-Off meeting are available at:**

**<http://science-media.org/conferencePage.php?v=31>**

**To view the presentations, click on "Conference contributions".**

### (2) 09:35 Overview of SOLARNET Project (by Rolf Schlichenmaier)

Rolf Schlichenmaier presents an overview of the SOLARNET project. He shortly summarizes the research infrastructures that are part of SOLARNET. The objectives, and the three pillars of the Networking Activities, the ACCESS program, and Joint Research Activities are described. Important projects overview numbers and dates are given. This includes the list of the work packages, distribution of resources and person months.

Rolf Schlichenmaier explains that the present version of the Consortium Agreement is not yet signed, but serves as the reference of this General Assembly.

He clarifies that the new DESCA model foresees a "**General Assembly**" (formerly known as "Board"), an **Executive Board** (formerly known as "Executive Committee"), and an **Advisory Board**. The Advisory Board will essentially consist of members of the General Assembly of EAST.

Decision: It is decided unanimously that it suffices to note in the Consortium Agreement that "The participants of the EAST GA shall agree on confidentiality on all matters concerning the SOLARNET project." It is not necessary to ask for a written agreement on confidentiality.

#### (2a) Compilation of Partner Representatives for the SOLARNET General Assembly.

**Quorum:** 69 people attend the Kick-Off Meeting. 29 members of the General Assembly are present while another 3 members of the General Assembly are represented, i.e. to summarize 32 out of 35 beneficiaries are either present or represented. This attendance corresponds to 91%. Thereby a quorum of 67% is fulfilled.

### (3) 10:00 Welcome and Guidelines by EU Project Officer (by Keji Adunmo)

Keji Adunmo gives general information and managerial recommendations. She expresses her interest to in the entire meeting, but due to time constraints, she stays during the morning phase. She introduces herself, states that she is responsible for handling all astronomy, astrophysics, astroparticle projects, IA, prep-phases, support actions (PO of ASTERICS and ESCAPE, too). Most importantly, she states that she trusts in good management of the SOLARNET project.

She further explains the importance of integrating the activities under the flagship programme because such programmes give access to infrastructures which the ERC is very keen on.

After SOLARNET FP7, SOLARNET HORIZON 2020 is the 2<sup>nd</sup> edition to one of such flagship programmes and the solar physics community is getting bigger. However, money (grants allocated) will stay the same also in the next flagship programme. Besides development towards further integration, e.g. accessing or establishing legal entities, infrastructure programmes, etc will maintain the same structure as before. Since the budget will remain the same, such EU flagship programmes are expected to become more and more competitive and the proposals will have to address the impending societal challenges.

Keji Adunmo was also leading the SOLARNET evaluation panel. In her opinion, the proposal was excellent which set the bar very high. She reminds the general assembly that is a lot of management work ahead to live up to such high standards.

She further adds that adjustments are always possible in case of changes, adaption, change of budget or reallocation of funds. Support is also available from a financial officer and a legal officer as required and many questions can also be answered by them. Such change requests are to be made through the Project Officer. Amendment of a grant is a quick process, but normally to be done before the end of the reporting period. Therefore, contact with Project Office via the Coordinator is important for the member participants.

Moreover, deadlines are part of the Grant Agreement and need to be respected. Minor delays do not need to be informed. However, the problems need to be reported in case for major delays. She draws attention to the fact that all deliverables that should be made 'public' according to the grant agreement, will directly go online in the portal and will be accessible. If it is accepted it will automatically be online. If certain deliverables should not be published as such, please inform the Project Office.

The partners shouldn't worry if deliverables are not accepted for a while and they do not appear online immediately. The Project Office will need to find time to go through it. Update or modification are possible. In that case, the Project Office needs to withdraw acceptance. Drafts could also be submitted. Reporting periods every 18 months. Reports are due in 2 months after the end of the Reporting Period (RP). The 'Midterm Review' is after end of first Reporting Period (RP), i.e. due in Month 20<sup>th</sup> although it might be possible to negotiate the timeline with an external reviewer. The new changes incorporated in the Horizon 2020 programme with respect to prior FP7, particularly with regard to Trans-National Access Programmes should not be overlooked.

Keji Adunmo refers back on to the Horizon 2020 landscape where there are several other projects and research communities in the area of astronomy. For example, 'RadioNet' – another project funded within the framework of the European Horizon 2020 program for integrating activities for advanced communities, invite advisors from other communities/coordinators of other projects. She recommends to get in touch and stay connected with similar project participants in the Horizon 2020 framework because larger initiatives in astronomy are important as they are related to the European Open Science Cloud Initiative where practices, modalities, and standards can be necessarily shared. Examples of such large cluster projects, with the objectives to work within the European Open Science Cloud Initiative, which received funding are ASTERISK - ASTERoseismic Investigations with SONG and Kepler and ESCAPE -The European Science Cluster of Astronomy & particle Physics ESFRI research infrastructures.

#### (4) 10:16 Presentation of Work Package 1 (WP1 – Management, by Markus Roth)

Markus Roth introduces the **SOLARNET Project Office** that is located at Leibniz-Institut für Sonnenphysik (KIS). Project Management Team consists of Rolf Schlichenmaier (Coordinator), Tirtha Som (Project Manager), Bettina Schäfer (Administrative Assistant), and Markus Roth (Project Scientist). Markus Roth is also chair of WP1.

The SOLARNET Project Office will provide to you

1. Scientific, technical and administrative management i.e. overall support needed for an effective coordination of the Project and appropriate management of resources
2. Financial management of travel related to Access Programmes and Mobility Programmes

**Address:**

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**SOLARNET Management** structure consists of:

1. General Assembly
2. WP1 Management & SOLARNET Project Office
3. Executive Board = Workpackage leaders

**The General Assembly is the ultimate decision-making body of the Consortium.**

1. The General Assembly consists of **one institutional representative** from each institute.
2. The members of the General Assembly shall annually elect a **Chairperson** from amongst those Board-members who are also members of the Executive Committee The chairperson shall produce written minutes of each meeting. He/She shall send the draft minutes to all members within 10 calendar days of the meeting
3. The General Assembly will meet: (i) at least once a year, (ii) at any time upon written request of 1/3 of the Members of the General Assembly and (iii) at any time upon written request of the Executive Board.

The General Assembly will execute the following functions:

1. Meet regularly, review and update the programme and strategic plan of action for the project and the project budget
2. Receive progress and financial reports from the Executive Board, the Coordinator, and the Project Scientist, the Joint Research Activities (JRAs) & Networking Activities (NAs) Chairs and the Forum for Access and Service (FAS)
3. Approve all technical and financial reports and plans to the EC
4. Make strategic decisions on the execution and development of the SOLARNET programme
5. Make recommendations as appropriate to the Executive Committee
6. Appoint the JRAs & NAs Chairs
7. Appoint sub-committees as necessary

**The Executive Board shall be responsible for the proper execution of the Project and for the implementation of the strategic decisions.** It will report to and be accountable to the general assembly.

The Executive Board shall consist of:

1. All WP leaders
2. Project Scientist
3. Project Manager

The Executive Board shall meet at (i) least quarterly (mainly via videoconference) and (iii) any time upon written request pf any member of the Executive Board.

**Pre-Financing**

1. Transfer of Pre-financing was initiated by the EU: 4 831 272.64 € (48.33 % from total eligible cost)
2. We will transfer the respective shares to the partners
3. Need agreement from you to keep 3.33% at the SOLARNET Project Office to adapt to the different needs of pre- financing during the ramp-up of the project

**Decision:** It is unanimously decided that SOLARNET Project Office (Coordinator) will keep 3.33% of Pre-financing payment to adapt to the different needs of pre-financing during the ramp-up phase of the project.

### **Acknowledgments**

All the researchers are requested to use the following acknowledgements in their publications, presentations, etc.

*'This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824135'*

### **Webpage**

The domain of the previous SOLARNET FP7 Project (<http://solarnet-east.eu>) will be transferred from IAC to KIS. This will be merged with the new website developed with support of project partner SMN GmbH.

The webpage will be divided with two areas: a) Public and b) Internal

a) Public portal will consist of:

1. Presentation of project and public deliverables
2. All websites of conferences, schools, workshops to be hosted there • Integrated into an Open Access Repository

b) Internal area will consist of:

1. Project documents
2. Project management tools
3. Long-term preservation of Project results

It is important to remain very active on social media, such as in YouTube, LinkedIn, Twitter etc. Besides dissemination the results and public outreach via social networking, efforts are needed to be focused on open access, open data, etc on project results.

### **Open Access & Open Data**

Open Access

1. All publications are required to be published under Open Access.
2. All material of conferences, workshops, schools are required to be easily accessible centralized platform.
3. Participation in Open Data Pilot is encouraged.
4. Ensure experimental data and results available are reproducible - Make science reproducible.

The conditions that are required to be adhered to ensure open access are:

1. Develop (and keep up-to-date) a Data Management Plan (DMP).
2. Deposit our data in a research data repository.
3. Ensure third parties can freely access, mine, exploit, reproduce and disseminate our data.
4. Provide related information and identify (or provide) the tools needed to use the raw data to validate your research.

The Open Data Pilot applies to:

1. The data (and metadata) needs to validate results in scientific publications.
2. Other curated and/or raw data (and metadata) that the participants specify in the Data Management Plan (DMP).

WP1 aims for 3 milestones and 6 deliverables.

## **10:45 Coffee Break**

## (5) 11:00 Decisions/Elections:

### (5a) Chair of SOLARNET General Assembly (6.3.1.1.1 of Consortium Agreement)

Rolf Schlichenmaier is elected unanimously as the project coordinator.

### (5b) Election of WP leaders

The following person are unanimously elected as WP leaders:

WP1: Markus Roth

WP2: Dan Kiselman

WP3: Francesca Zuccarello

WP4: Richard Morton

WP5: Nazaret Bello González

WP6: Manolo Collados

WP7: Oskar von der Lüche

WP8: Markus Roth

WP9: Dan Kiselman

WP10: Mats Carlsson

### (5c) The members and chair of the Executive Boards (6.3.2.1 of Consortium Agreement)

It is unanimously agreed that the Executive Board shall consist of the WP leaders, the Project Scientist, and the Coordinator, and that it shall be chaired by the Project Scientist (Markus Roth).

## Presentations of Work Packages

### (6) 11:11 Work Package 2 (WP2 – Coordination for improved exploitation of solar physics infrastructure, by Dan Kiselman)

The budget is relatively small for this work package. Dan Kieselmann is responsible for monitoring all activities including giving wake-up calls to all those who are leading these activities (sub-tasks implementation).

He introduces the planned activities under the two main sub-WPs which are essential to implement the objectives of WP2.

#### 1. **WP2.1 Access and telescope operations**

##### **WP2.1.1. Coordination of access programmes**

There are two access programmes:

- I. Trans-National and
- II. Virtual Access Programme

EAST Time Allocation committee will take care of the Access Programmes, telescope and computer time.

Virtual access will be supervised by an external committee.

##### **WP2.1.2 Forum for Solar Telescopes and Data Bases**

A forum will be arranged where all interested attendees are welcome to attend. There is a plan to have four physical meetings with the first meeting being conducted towards the end of year 2019. Assistance and cooperation are expected from KIS, UiO, ROB.

##### **WP2.1.3 Coordinated Telescope Operations**

It is common to coordinate different observations, e.g. from ground and space. This research community will continue this by a group led by Leibniz-Institut für Astrophysik (AIP) in Potsdam,

Germany who will try out things and run test campaigns. Collect experiences and write guidelines with good practices from what was learned. NINS/NAOJ (Hinode) and Mullard Space Science Laboratory MSSL/UCL (PI of EIS@Hinode) will be added as partner institutes in this work package.

#### **WP2.1.4 Coordination between ALMA and ground-based solar telescopes**

A special activity is the coordination between ALMA and ground-based telescopes. Lead by ASU, the guidelines will be developed and adapted.

#### **WP2.1.5 Service mode observations**

For efficiency service mode observations will be explored. Telescope staff will carry out observations in queue mode. This will be a learning experience for the EST. It is envisaged that EST will have certain fraction of service mode operation. The service mode operations were developed during SOLARNET-FP7 & now used in some telescopes but only for a limited fraction of time. This is because the main challenge is how to translate scientific ideas into scientific mode operation. Guidelines for Telescope-Service-Mode Operation will be written also based on this experience.

### **2. WP2.2 Joint research activities (JRA) Coordination and dissemination of results**

#### **WP2.2.1 Networking activities (focussed on solar instrumentation)**

Formally the networking for the JRAs will be organized here led by IAC. Organization is to create an e-mail list, online seminars and workshops.

#### **WP2.2.2 Networking activities related to atmospheric turbulence and seeing**

It is discussed to organize a workshop 'MCAO for EST' dedicated for this activity.

#### **WP2.2.3 Coordination of development of software tools**

It is discussed that an inventory of tools (computational, visualisation & analysis) will be made available.

#### **WP2.2.4 Metadata definitions for observational data**

Recommendations for a grand database and appropriate meta database has been made in in the first SOLARNET-FP7. This is important for usage and re-usage of observational data, simulations results, etc. Emphasis will be given to this relevant activity in this SOLARNET HORIZON 2020 and existing recommendations shall be considered. This activity will be led by UiO.

#### **WP2.2.5 Metadata definitions and database structure for numerical simulations.**

Similar effort will be made for data from numerical simulations. This activity will be led by UiO

#### **WP2.2.6 Big-data storage**

Lead by KIS, leeway to store big data will be investigated and a report will be summarized. Besides, the possibility to store the data under the European Open Science Cloud will be explored.

WP2 aims for 1 milestone and 22 deliverables.

#### **Comments/ Discussion:**

- Rolf Schlichenmaier (coordinator) comments, that coordinated observations will be done with Hinode, i.e. NINS/ NAOJ should be added as partner. Also, MSSL/UCL could be a partner as they are PI of EIS@HINODE

## (7) 11:24 Work Package 3 (WP3 – Network Activities to Foster Synergistic Collaborations, by Francesca Zuccarello)

WP is split into four workpackages concerning meetings & workshops, mobility, training activity and schools. This WP aims are to foster collaborations between different solar physics groups to promote the interaction and cooperation among researchers. There is a special focus to foster collaborations between theoretical calculations and experimental observations and instrument builders.

### 1. **WP3.1 Meetings and Workshops on Solar Physics to enable efficient collaboration**

Francesca Zuccarello presents an overview of the planned meetings, the proposed topics, potential organizers, and the envisaged venues. To support the organizational and travel costs of invited speakers, 20 k€/ Meeting and 10k€/ Workshop is planned to be provided.

### 2. **WP3.2 Mobility programme**

Within the framework of the mobility programme, the aim is to support research stays up-to 2-3 months for early-stage researchers (ESRs) and 2-3 weeks for senior/ experienced researchers. Periodic calls will be issued and the applications will be evaluated by an evaluation committee (Mobility evaluation committee, MEC). 30 young, 15 senior researchers will be supported altogether with 120k€. The institutions who are willing to host young researchers will provide extensive information on the research activities. Participants are required to check the information and update it. Description of activities to be send to Francesca Zuccarello by the respective contact person.

### 3. **WP3.3. Week above the clouds – sub-WP organized by KIS once a year**

Short stays for one week per year for students and early career researchers at solar telescopes with access to VTT and GREGOR will be provided. In addition, lectures will be held on a range of topics. Support is planned to be provided to 15 students and 7 lectures with 15k€ per event.

### 4. **WP3.4 Summer/ Winter Schools**

Five (summer/ winter) schools are planned for 25-30 students with a budget of 20k€ per event.

She further provides an overview on the deliverables and requests the project partners to go through a to-do list regarding:

- Mobility evaluation committee (MEC)
- Statement of partner to indicate willingness to host young and senior researchers
- Webpage with information on hosting institutions
- first mobility call
- agree and fix the dates for the training activities and the schools

WP3 aims for 3 milestones and 8 deliverables.

## (8) 11:43 Work Package 4 (WP4 – Engagement, Dissemination and Communication, by Richard Morton)

Richard Morton introduces the Northumbria university, reviews previous Solarnet FP7 achievements, and ongoing PRE-EST activities. These activities provide opportunities for synergies with current Solarnet Horizon 2020. In the past researchers were not well-trained in outreach activities. Therefore, the objective of WP4 to provide public engagement training, share best practices, change attitude, share key achievements.

He further introduces the planned activities under SOLARNET Education and Communication under the two main WPs.

## 1. **WP4.1. Improving Communication and Engagement capacity**

The main tasks under this WP is planned to be executed under four sub-WPs as follows.

**WP4.1.1 Design respective workshops and training sessions** – for continued professional development

### **WP4.1.2 Deliver the workshops**

- I. Two workshops are planned – (i) first focusing on the schools and (ii) then on engaging researchers to deliver outreach to the wider general public.
- II. Distribute a questionnaire to learn about the attitude in the community.
- III. Provision of shorter training sessions at the SOLARNET PhD schools: An introduction to science communication

**WP4.1.3 Resources for training, education and outreach.** Appropriate training and open-access material will be provided on the SOLARNET website

**WP4.1.4 Develop suitable criteria for assessing the impact of Continued Professional Development (CPD).** Assessment data from the participants will be used to provide for a continuous evaluation feedback loop.

## 2. **WP4.2. Communication and Dissemination**

The main tasks under this WP will be sub-divided into five sub-WPs.

**WP4.2.1 Development of infrastructure and maintenance of Solarnet website.** The main mission is to develop a two-level structured website – a public area and an internal area.

**WP4.2.2 Open access channel.** The important task in this is the website is also to provide with the open access channel.

**4.2.3 Conference Platform.** Further, the development of a conference platform is aimed to provide detailed information on the workshops, schools, etc. This conference platform will also contribute to the dissemination activity by making the conference presentations available for the next 10 years.

**4.2.4 Delivery of dynamic online content.** The idea is to provide scientist profiles, Solarnet science nuggets, and news articles.

**4.2.5 Utilisation of social media to engage with different audiences.** Other tasks are the Dissemination, Communication and Exploitation plan and the data management plan.

WP4 aims for 6 deliverables.

### **Discussion:**

- Luis Bellot comments that he is leading communication in PRE-EST and suggests that common activities can be merged.
- Markus Roth remarks that we need to highlight which tweet is coming from which project.
- David Berghmans adds that reaching out might be more impactful if done in the national languages across Europe.

## **(9) 12:00 Work Package 5 (WP5 – Towards a European Solar Data Center, by Nazaret Bello González)**

New telescopes and new missions with solar observatories are prepared. The primary discussion is focussed on how will the large volumes data delivered be handled and calibrated, on how multi-instrument analysis is needed. It is planned that 1 Million Euro is to go along with the activities involving data calibration, achieving, visualization tools, coupled with distribution of human efforts among involved partners.

Nazaret Bello González presents the four main lines of action which will be followed in the form of four sub-WPs:

1. **WP5.1 Data calibration.** This sub-WP will involve development of data pipelines, real-time image reconstruction using machine learning capabilities, image restoration for EST, combining speckle and MOMFB methods, slit-spectra reconstruction.

2. **WP5.2 Data archiving and development of advanced data search techniques.** These have common interests with action undertaken by many institutes. Standardised metadata is expected to be a part of the curation process.
3. **WP5.3 Data dissemination.** During SOLARNET FP7, a prototype Solar Visual Observatory (SVO) was developed and recommendations for metadata definitions were made. Now ROB will lead in developing the prototype into an operational SVO.
4. **WP5.4 High-level data products and visualization tools.** The main objective is to develop and provide user-friendly visualisation tools for big data volumes in addition to basic computational tools and high-level data and analysis tools.

This work package aims for 2 milestones and 12 deliverables, mostly due towards the end of the project. A few are due in month 12 and 36. Therefore, there is a call to keep the networking as much as possible to avoid parallel as many development paths are going.

#### **Discussion:**

- Markus Roth supports that high communication flow in this WP
- David Berghmans enquires how does the Data Management Plan (DMP) influence the work here.
- Markus Roth replies that WP4 and WP5 needs to be linked here.

## (10) 12:12 Work Package 6 (WP6 – Advanced Instrumentation Development, by Manolo Collados)

This WP is devoted to development of advanced instrumentation. In this sense it is a continuation of the work done previously in SOLARNET FP7.

Manolo Collados presents the ideas behind the four objectives of this WP, i.e.

1. **WP6.1 Improvement of techniques.** This sub-WP aims to continue the work on the improvement of image slicers for 2D spectroscopy as these are integral field units and performance of the prototypes need to be improved for EST
2. **WP6.2 Microlens-fed spectrograph.** To continue improving the performance of microlens-fed spectrograph. For EST a 30k x 30k detector will be required, which currently do not exist. Also, methods are to be developed to obtain a possible splitting of the FOV.
3. **WP6.3 Design concept of a Narrow-Band-Tunable-Filter Imager.** To address the challenging topic of tunable filters which will further be applicable in EST.
4. **6.4 Absolute high precision polarization measurements.** Explore absolute polarization measurements. Currently, a new device is being tested on the ZIMPOL polarimeter at IRSOL in Locarno to correct the systematic effects produced by the instrumentation and thus increase the polarimetric accuracy. The new device will also be installed on the GREGOR solar telescope in Tenerife, which will serve as the final test bench for the EST.

Manolo Collados also discusses the advantages of telecentric and collimated setup, which needs to be decided for EST. This WP6 aims for 6 milestones and 17 deliverables. He concludes that the WP is very ambitious task as it defines the future instruments for EST.

#### **Comments/ Discussion:**

- Markus Roth comments that the IFUs can be used at other facilities, too.

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## 12:45 Lunch break

### (11) 14:15 Work Package 7 (WP7 – Multi-Conjugate Adaptive Optics for EST, by Oskar von der Lühe)

Oskar von der Lühe reviews the success in developing multi-conjugate adaptive optics (MCAO) system and highlights the advantages in comparison with a conventional single-mirror adaptive optics system.

The objective is to produce a MCAO system that will be integrated in the EST. The development of such MCAO system is rather complex and the mechanism needs to be understood in order to control such a system. In addition, a demonstrator/ prototype should be built that looks at the Sun under daily conditions.

Oskar von der Lühe further reviews on previous activities in the EST design study, Solarnet FP7 and GREEST. One of the major goals for the JRA to execute the research work that is needed to complete preliminary design and to demonstrate the viability, i.e. that it actually works. The personal effort is approximately 300-person months (PMs), which is the biggest one, where 143 PM are paid by the project. He goes through the list of objectives, the participants and PM distribution.

He outlines the four sub-WPs.

1. **WP7.1 Prototype development and Tests.** This which deals with the hardware development
2. **WP7.2 Neural Network Control System.** The neural networks play a significant role in night-time adaptive optics (AO) and the feasibility to day-light AO will be explored.
3. **WP7.3 Performance Characterization and Prediction.** MACO system produces a lot of telemetry data, which provides information about the situation of the atmosphere and give estimate on the PSF. This could be applied to correct the later data. This sub-WP is linked to WP5. Besides, the quality of sites is evaluated. One of the concerns with MCAO is what is the distribution of turbulence with height at both sites. A couple of ways how this turbulence will be measured are used.
4. **WP7.4 Technology Research.** New ways of wave front sensing will be explored. The current capabilities of the cameras are not sufficient. Therefore, deformable mirror technologies are explored with the industrial partner ALPAO.

Over all, this WP7 aims at 3 milestones and 19 deliverables.

#### Discussion:

- Michal Sobotka enquires how far is the DKIST community in the development of MCAO.
- Oskar von der Lühe replies that we are essentially the DKIST community because the same group of scientists working for DKIST are here to collaborate.

### (12) 14:45 Work Package 8 (WP8 – Solar Physics Research Integrated Network Group, by Markus Roth)

Markus Roth introduced the main objective of this WP which is development of instrumentation for large field-of-view observations of the Sun with a network of solar telescopes in support of observations with existing high-resolution solar telescopes (either isolated or in a coordinated way).

Technical Requirements / Future synoptic telescopes should provide for:

1. Full-disk Doppler velocity images
2. Full-disk vector magnetic field images
3. Full-disk intensity images
4. Measurements of quantities relevant for space weather

5. Provide the above data products in a variety of wavelengths
6. Provide the above data products at a high cadence ( $\leq 60$  seconds)
7. Provide the above data products at a spatial resolution of 1" (0.5" pixels)
8. Provide the above data products at least 90% of the time
9. Provide the above data products for at least 25 years
10. Complement space missions

He explains that the main scientific goal is to study that long-term behaviour of solar magnetism. For the experiments a Front-end Design Concept is envisaged mounting several telescopes together because the accurate spectropolarimetry of the solar magnetic fields requires signal-to-noise ratio of 1000 for photospheric lines and 10000 for chromospheric lines in Stokes measurements.

Translate the technical concept for Solar Physics Research Integrated Network Group (SPRING) developed under SOLARNET FP7 into a preliminary design. The key scientific areas supported by this facility are:

1. Solar awareness (arc-second resolution context images)
2. Synoptic magnetic fields (activity complexes, solar magnetic cycle)
3. Synoptic velocity fields (surface and interior dynamics, wave phenomena, helioseismology)
4. Transient events (flares, active region evolution, space weather)

Activities intended i.e. the next steps required towards building such a network are described and incorporated under the three sub-WPs.

1. **WP8.1 Design of the mounting telescopes and instrument platform**
2. **WP8.2 Design and proto-typing of the post-focus instruments**
3. **WP8.3 Definition of the data recording and processing pipelines**

Markus Roth outlined the first Steps for this WP:

1. Organize a meeting to coordinate work
2. Participation of all partners from SOLARNET, in addition invite international partners
3. Synchronize with further ongoing activities, e.g. NSO seeks for own money to contribute
4. Meeting to be held in Freiburg

WP8 aims for 4 milestones and 10 deliverables.

## (12) 15:03 Work Package 9 (WP9 – Trans-National Access Programme, by Dan Kisman)

Dan Kisman emphasizes that this WP is budget-wise that most heavy WP. The idea is to open the facilities to the users for no cost.

He reviews the earlier Access Programmes OPTICON for the ground-based telescopes and SOLARNET FP7. These two programmes were important for community building and has been very important for the UK. In SOLARNET HORIZON 2020, we have the newly incorporated balloon mission Sunrise 3 and a Supercomputer Piz Daint. In a sense this is integration and training programme for EST.

He further reviews the present installed infrastructures of GREGOR; VTT; SST, Themis alongside Sunrise 3 and the Piz Daint Supercomputer and emphasizes the tremendous scope to create contacts with the theoretical side of solar physics, to run simulations. i.e. collaboration between theoreticians and experimentalists.

Table of access are offered at the facilities. The Organization of this is done by the EAST Time Allocation Committee (EAST TAC) with a representative from each installation. External referees will help evaluate

the proposal. A call proposal was already put out on December 15, 2018. Call closed on January 20, 2019 and received enormous oversubscription.

He further explains the formalities on the rules for the access programme in the Grant Agreement. In principle only, Spain is excluded. But the suggestion is to exclude also the countries that owns the installation. \*

The interpretation for Sunrise 3 is not clear. Access to non-EU or associated countries is limited to 20% of the total amount of units of access provided under the grant. This could be a backstop in case of a non-deal Brexit. Rules for granting of access proposals is somewhat delicate in its formulation. SST is offering service mode, which might be complicated for the book-keeping of the observing time. Example: How is the time accounted, when clouds prohibit observations? There are also further challenges related to communication and travel.

There will be one more call for proposal at GREGOR and VTT in the year 2019. Call for Piz Daint will be held at the latter half in 2019. Procedures must be worked out to channelize the process and to avoid flooding with oversubscription. A questionnaire is being prepared for the call. Procedures must be worked out for proposal call for Sunrise 3 which will set out for its mission in 2021. Besides, mechanisms need to be worked out to make the data public. A new common application interface needs to be developed.

WP9 aims for 3 deliverables within the Trans-National Access to Research Infrastructures.

#### **Discussion:**

- Mihalis Mathioudakis enquires what is the policy with the data that will be acquired during the Access Programme.
- Dan Kiselman replies that needs to be sorted. First ask the operators to do it.
- Mihalis Mathioudakis questions whether there is an opportunity to get a small number of hours for testing the codes and to evaluate the time required to complete certain runs.
- Michele Bianda remarks that will be is an excellent procedure and agrees to execute a small pre-run test.

\* Further discussions regarding the access programme eligibility

- Bob Bentley thinks that Spain is not excluded, because the rule says "the majority of researchers must work in a country other than the country(ies) where the installation is based"
- Dan Kiselman agrees to that.
- Oskar von der Lühe enquires whether the 20% rule for international mean that they are covering the travel costs for the international users
- Dan Kiselman replies that we need to look it up
- Markus Roth thinks the answer is yes.

## **(14) 15:20 Work Package 10 (WP10 – Virtual Access Programme, by Mats Carlsson)**

Mat Carlson explained that under this WP, user support is to be efficiently provided through the internet. Five partners are involved with different work load, which has now to be recorded in time sheets.

The data centers involved in this programme are:

1. The Hinode Science Data Center Europe with new functionality and search interface which will made be available
2. Belgian BE-WISSDOM, Solar Dynamics Observatory (SDO-AIA) data base and Solar Virtual Observatory (SVO).

The SVO will have the Stockholm SST data (at least Solarnet SST data) available in 2020

3. GRIS data archive with more functionality
4. IBIS has now more data (in the proposal 14 campaigns, 92 days, 20 TB) and more calibrated data products

There are six deliverables, two for each reporting period (i.e. on 18<sup>th</sup>, 36<sup>th</sup> and 48<sup>th</sup> months), which will contain statistics and conclusions out of them. The examples from Hinode and BE-WISSDOM from SOLARNET FP7 will be followed. An external committee will access this virtual infrastructure support.

**Discussion:**

- Mats Löfdahl questions the relationship between the archive in Oslo and the one in Belgium, e.g. for the SST data.
- Mats Carlsson replies that remains to be worked out. Currently no meta data are being feed to Belgium. Once the virtual observatory starts to run, the data will be submitted there.
- Robbe Vansitnjan remarks that people can already check-out the prototype of the SVO.

WP10 aims for 6 deliverables within the e-Access to Research Infrastructures.

## (15) 15:40 Miscellaneous

**Discussion:**

- Dan Kiselman: Do we need to record also the time in the sub-WPs or is the timesheet sufficient that reflects the WP
- Markus Roth clarifies by saying time sheets with WPs not sub-WP

15:45 End of General Assembly

15:50 - 16:00 Coffee Break

Sub-groups of work packages met and discussed the project.